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ABSTRACT

Described is the integrated model of services for deaf students at California State University at Northridge, in which deaf students attend regular classes with the aid of interpreters. A review of previous research considers the attending behavior of deaf persons to the interpreter, the onset of fatigue in the interpreter, and the ways in which deaf persons respond to information in American Sign Language and Signed English. A review of current research focuses on an investigation of the receptive skills of the interpreter which concluded that reading comprehension was a function of experience. (CL)

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Research in Sign Language Interpreting at California State University, Northridge

by

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The nature of communication through the use of sign language is of growing interest to educators, psychologists, and linguists. For example:

1. In California, Nevada, and Oklahoma, psychologists are exploring the ways and means by which primates communicate with each other, and with humans, after they have been taught sign language.

2. In Washington, D.C., and La Jolla, California, linguists are in the process of describing the grammar of a unique language, American Sign Language.

3. At California State University, Northridge (CSUN) the use of a sign language interpreter in regular classes offers an exciting alternative model of educating deaf college students.

Still, not much is known about sign language or a particular use of it which we call interpreting.

One reason for the relative lack of knowledge is that the use of sign language has been discouraged in the education of deaf children. At the first International Congress of Educators of the Deaf, held in Milan, Italy, in 1880, a resolution was passed which declared the superiority of speech over signs and which stated that the preferred method of teaching deaf children was to be the oral method (Meadow, 1972).

From 1880 until just the past ten years or so, most educators of the deaf assumed that the use of sign language by young deaf children would result in inhibited reading, writing, speaking, and speechreading skills. The Milan Conference held that sign language had the disadvantage of injuring the "precision of ideas."

A small number of educators felt that the use of sign language would facilitate and accelerate the development of these same skills. Their

model was the deaf child of deaf parents who learned sign language in the home, and who seemed to do as well, if not better, in language skills, academic achievement, and psychological growth.

The difference of opinion remained just that until some recent research brought some objectivity to what had previously been an emotional argument.

Through the late 1960's and early 1970's, two developments paralleled each other.

First, research was reported on the educational, psychological, and social gains of children who used, and did not use, sign language. Studies by Mendel and Vernon (1971), and Schlesinger and Meadow (1972) showed superiority of early users of sign language over non-users or late users of sign language. Deaf children of deaf parents--users of sign language from birth--achieved at greater academic levels and had fewer psychological or social problems than non-users, or late users. None of these studies showed negative factors in any phase of language development among the early users.

Secondly, linguists (Stokoe, 1976, Bellugi, 1972) were coming to the conclusion that sign language, as used by most deaf adults and thought for so long to be "poor English" was not English at all, but a distinct language. The name, American Sign Language, was given to a symbol system which was ordered in a unique way; so unique, in fact, that it was concluded that it had the integrity of a distinct language, one that is not English.

In other words, American Sign Language (sometimes called ASL or Ameslan), is <u>not</u> English.

Fant (1974) writes: "Ameslan is a legitimate language in and of itself. That is to say, it is not based on English, but stands by itself, on its own feet. If English did not exist, Ameslan could still exist, just as French or Spanish exist independently of English."

The conclusion that American Sign Language is not English becomes more understandable when one realizes that the sign language used by most deaf people in the United States was imported from France in 1917. There appears to be a higher correlation between American Sign Language and French Sign Language than between American Sign Language and a system used in England. The system used in England has a different syntax and less mutual agreement upon symbols used.

While investigating the uniqueness of American Sign Language, it was found that not all manual expressions in that language are independent of English. In fact, it is possible to sign in one language (American Sign Language), or the other (English), or indeed, in a combination of both.

I feel the obligation to interject at this point that it is not the purpose of this paper to fully defend or explain these various systems. For those with a special interest in the distinct properties of the manual languages, let me refer you to the literature, and let me now say that the purpose of this paper is to describe how deaf students and sign language interpreters function at CSUN.

Deaf Students at CSUN

During the Spring semester of 1977, 169 deaf students shared the college experience at CSUN with approximately 27,000 non-handicapped students. Deaf students attend regular classes. The faculty has no special knowledge or training to deal with the problems of deafness.

A unit known as Campus Services for the Deaf provides "support services" to these deaf students to insure their academic success. The major support service is interpreting. Other services include notetaking, tutoring, and counseling.

Approximately 80 part-time interpreters, most of whom are themselves students at CSUN, are available to serve these 169 deaf students. Deaf students registered in 485 classes, of which 268 classes, meeting on the average of three times per week, were served by interpreters.

The typical classroom situation has these components: a regular professor, an interpreter, a deaf student or two, and 20-25 non-handicapped students.

The interpreter hears the spoken remarks of the professor and translates the remarks into sign language for the benefit of the deaf student.

When a deaf student wishes to ask a question or make a comment, he does so in sign language and the interpreter translates this into spoken language for the benefit of the professor and the other students.

This form of "integrated" education is an alternative model to the more traditional form of "segregated" education, where deaf students are educated only in the company of other deaf students and who are

taught by instructors who simultaneously transmit lectures in spoken language and sign language.

The integrated model is thought to have these benefits (Jones and Murphy, 1972, 1974; Carter, 1976).

1. There are considerably more curriculum offerings at CSUN from which deaf students may choose than at a smaller segregated institution.

2. Non-handicapped students come to understand the special talents of deaf persons.

3. The normal working and social patterns of life bring handicapped and non-handicapped individuals together; therefore, it is felt that educational models should approximate the experience one will face upon leaving college.

4. Contact with deaf students influences the career choices of non-handicapped persons. Hearing students who have had classes with deaf students are more likely to learn sign language and serve as interpreters while in college, and to consider careers in areas of service to deaf persons.

Because the model of integrated education is relatively new and because our knowledge of sign language and sign language interpreting is relatively sparse, the Campus Services for the Deaf unit in addition to delivering interpreting services, is also responsible for research and evaluation studies that deal with the effectiveness of the services.

Sign Language and Interpreting Studies

The remainder of this paper is divided into two parts.

The first part deals with brief reviews of studies of: the attending behavior of deaf persons to the interpreter, the onset of fatigue on the part of the interpreter, and the ways in which deaf persons respond to information transmitted in two different ways (American Sign Language, and Signed English).

The second part of the paper deals with a series of current research studies designed to document the relative efficiency of sign language in the transmission and reception of messages.

Part I: Review of Previous Research

Attending Behavior

The deaf students at CSUN must see language. They must actively attend to the linguistic stimuli which they receive through an interpreter.

The need to attend visually requires constant activation of the voluntary neuro-muscular mechanism. This leads to fatigue.

Information may be missed and misinterpreted if an attendee blinks or momentarily turns away. Imagine the ensuing confusion if one missed the word, NOT, in this sentence: there will not be a test tomorrow.

Imagine also an environment in which there is dust, or smoke, or in which there is visual "noise," i.e., two or more persons in the visual field, background movements, bright lights, clashing colors, etc.

These things lead us to conclude that deaf persons cannot attend, visually, 100% of the time to such things as a college lecture which could go on for an hour or more. This raises the question of interest: what is a reasonable estimate of attending behavior on the part of deaf college students at CSUN?

Rudy (1976) attempted to determine the rate of attending behavior of CSUN deaf students to their interpreters. The procedures were unsophisticated: he observed deaf graduate students and attempted to determine when they were, and when they were not, attending to an interpreter. He used a cumulative stopwatch as he observed 14 deaf students in 14 different graduate education-class situations. He observed attending behavior in five minute segments. He recorded attending behavior during the first, third, and fifth five minutes of each class period. In other words he recorded for five minutes, did not record for five minutes, recorded the next five minutes, did not record the next five minutes; recorded the next five minutes. Over a 25 minute period he recorded for 15 minutes of that time.

Rudy found that the overall attending rate was 88%. In other words, these deaf students watched the interpreter 88% of the time and did not watch the interpreter 12% of the time. He also found attending behavior to be greater in the earlier periods of time. Attending rates tended then to drop as time went on.

The attending rate of 88% is almost certainly an overestimate of attending behavior. This is so because Rudy used the most academically capable deaf students, i.e., graduate students at CSUN. Also, the subjects knew they were being observed and the measures were estimated only over the first 25 minutes of a class period whereas most class sessions go on for an hour or more.

Nonetheless, Rudy's contribution is twofold: (1) documentation of the basic rate of attending behavior, and (2) documentation of the attrition of attending behavior over time.

These two considerations are critical to the efficient use of interpreters and also suggest training strategies to increase attending behavior.

Clearly the need for more research in this area, using more precise methodologies, is apparent.

Fatigue on the Part of the Interpreter

A deaf person may experience fatigue in attending to an interpreter. The interpreter may also experience fatigue in delivering sign language.

Sign language is delivered with considerable physical effort. CSUN interpreters are asked to mouth what they hear as well as to deliver the message manually. The fingers and arms are mostly used in delivering signs and fingerspelling, but the whole body comes into play as well. Consequently, fatigue on the part of the interpreter is a predictable factor.

Brasel (1976) examined the error rate of information delivered by interpreters over time. It was found that interpreting skills remained at their highest levels during the first 30 minutes. After 30 minutes there was a slow but steady increase in errors, and after 60 minutes, the error rate became statistically significant.

Brasel concluded that interpreting skills begin to deteriorate after 30 minutes of interpreting, and begin to deteriorate significantly after 60 minutes.

Obviously, interpreters should be rotated or a single interpreter should have a rest period after about 30 minutes of interpreting, wherever possibl..

American Sign Language and Signed English

As noted earlier in this paper, it is possible to sign in American Sign Language, which is not English, or an English form of manual communication, Signed English, or a combination of both.

College-level deaf students, who have mastered 12 years or more in a school system which emphasizes success in the use of English, obviously have high English skills, even though they may be most comfortable with American Sign Language.

In a study by Murphy and Fleischer (1976), CSUN deaf students were asked to state their preference of either American Sign Language (ASL) or Signed English (Siglish).

The ASL group was broken into two subgroups. Half received treatment in ASL; half received treatment in Siglish. The Siglish preference group was also divided into two subgroups, of whom half received treatment in Siglish whereas the other half received treatment in Ameslan.

It was found that there were no statistically significant differences regardless of preference and no statistically significant difference regardless of treatment received. Those who preferred Ameslan and received Siglish did as well as those who preferred Ameslan and received Ameslan. Those who preferred Siglish and received Ameslan did as well as those who preferred Siglish and received Siglish.

It is clear from this study that CSUN deaf students have bilingual skills as evidenced by equal facility in two languages, regardless of their stated preference for one language over the other. Since CSUN interpreters receive training in both languages, it would appear that they are appropriately prepared to deal with the CSUN population of deaf students.

Part II. Review of Current Research

Information processing models have been identified to test the efficiency of sign language in the transmission and reception of messages. These models approximate usual classroom practices in that they parallel (A) the transmitting mode of delivering sign language, and (B) the receiving mode of understanding sign language.

In the first instance (see Figure 1) a spoken verbal message originates with a lecturer, is processed through an interpreter, and is received by a deaf person. The dependent measure is test scores of deaf subjects based on information processed.

Insert Figure 1 About Here

The second processing model has two components (see Figures 2 and 3). In Processing Model B_1, a message has a manual origin, and is received by an interpreter. The dependent measure is test scores of material received by the interpreter.

Insert Figure 2 About Here

Insert Figure 3 About Here

In Processing Model B_2, a message has a verbal origin and is received by an interpreter. The interpreter must now verbalize the message in spoken English to a third party. The dependent measure here is test scores of material received by the third person.

With the above in mind, we may now talk about three behaviors of interpreters: transmitting (Model A), receiving (Model B_1), and reversing (Model B_2).

The following explanations for these terms seem to meet general agreement among interpreters:

1) To transmit: the interpreter listens to the spoken word and transforms the spoken message into sign language.

2) To receive: the interpreter attends to and understands the sign language of another person. He is not required to verbalize what he receives. This might also be thought of as "reading" the signs of another. One who is skilled at this is said to evidence "reading comprehension."

3) To reverse: in addition to being able to "read" the original signer, the interpreter must also vocalize the message. He follows the incoming signs and as he reads, he also verbalizes what he sees. Both are done at nearly the same time, with the verbalizing slightly behind the reading. This is considered the most difficult task of the interpreter because the initiator of the message may be transmitting in one language (American Sign Language) while the vocal translation may be in another language (English) and the reading and the translation must be done at almost the same time.

One of our research interests deals with the experience of the interpreter. CSUN is a major training center for interpreters and also the world's largest employer of sign language interpreters. We offer a certain sequence of training courses and assign and pay interpreters according to their experience. Hence, it would seem reasonable that we would explore this variable closely to see how efficient our training has been, and to suggest other ways to manipulate the quantity and/or quality of the experience in order to improve the entire interpreting situation.

In one study it was found that the transmitting skills of interpreters at different levels of experience were essentially equal. In other words, interpreters with Minimum experience transmitted about as well as interpreters with Maximum experience. This first study was limited to transmitting and did not deal at all with receptive (receiving) or reversing skills, which are generally considered by interpreters to be higher order functions of somewhat greater difficulty than simply transmitting.

The practical application of the finding of this first study to postsecondary education is limited to specific situations where material needs only to be transmitted. This assumes a passive receiver. It is clear, however, that college students best acquire knowledge in an interactive environment, i.e., one in which information is received and where a student may question a lecturer and comment on the lecture material.

Therefore, it seemed reasonable to examine the receptive skills of the interpreter, as well as the transmitting skills. Consequently, a second study was designed to gather evidence on the "receiving" or "reading comprehension" skills of interpreters at different levels of experience. Studies on the "reversing" skills of the interpreter are planned in the future.

Methodology

Reading comprehension of the interpreter was tested through a series of videotaped lectures. Typical college lectures originally devised by Jacobs (1976), were signed on camera and a master black and white tape, without sound, was made for research purposes.

The material consisted of one practice lecture, and five research lectures. Each lecture averaged about five minutes in length. After each lecture, the interpreter-subjects received a 10-item test.

The on-camera signer held a Comprehensive Skills Certificate (CSC) from the Registry of Interpreters for the Deaf. He carefully rehearsed each lecture and played a verbatim audiotape in the studio to cue his signing. The audiotrack was erased in the master tape used in the study.

The signer rarely used lip movements. He rendered the lectures in American Sign Language vocabulary, yet followed an English syntax.

Results

It was found that interpreters with a greater amount of experience outscored interpreters with less experience. More specifically, interpreters with 1,200+ hours of classroom interpreting experience at CSUN significantly outscored those who had less than 300 hours of classroom interpreting experience at CSUN. Those with between 600 - 900 hours of classroom interpreting experience also significantly outscored the lesser experienced group, but were the approximate equals of the group with the most experience.

From these data it was concluded that reading comprehension appears to be a function of experience. It may also be concluded that interpreters of Moderate experience appear to "read" about as well as those with Maximum experience. One further conclusion is that interpreters with Moderate and Maximum experience appear to "read" somewhat better than interpreters with Minimum experience.

Data were analyzed in still another way. In the earlier cited Jacobs study, hearing students with no knowledge of sign language, and deaf students who normally use an interpreter in CSUN classes were subjected to the same lecture. These were delivered auditorially in a live situation, and were interpreted at the same time in a single room in which there were hearing and deaf individuals. A comparison of their scores with the scores of interpreters with various levels of experience leads to some interesting conclusions.

Group I - Hearing subjects in Jacobs' study with no knowledge of sign language

Group II - Deaf subjects in Jacobs' study who depend on an interpreter at CSUN

Group III - Minimal level interpreters

Group IV - Moderate level interpreters

Group V - Maximum level interpreters

Post hoc comparisons showed no significant differences between scores of Minimum level interpreters and Deaf subjects on most tests. Therefore, it is concluded that Minimum level interpreters evidence reading comprehension skills at least equal to, and perhaps a little better than, CSUN deaf students.

Further comparisons show that Moderate level interpreters outscored the Deaf group and that Maximum level interpreters outscored the Deaf group. It is concluded that the Moderate and Maximum level interpreters evidence greater reading comprehension skills than CSUN deaf students.

Additional comparisons were made between the three interpreting groups and the Hearing group from the Jacobs study. It was found that

the Hearing group outscored the Minimum level interpreters. No significant differences were found between the Moderate and Maximum level interpreters and the Hearing group.

It is concluded that scores obtained by Minimum level interpreters after reading sign language messages are inferior to scores of a Hearing group receiving information through audition. It is further concluded that Moderate and Maximum level interpreters "read" as much information through signs as CSUN hearing students do through normal audition. More will be said about this later in this paper.

Discussion

This research followed small group research models and the usual cautions govern interpretation of the following findings.

It has been found that reading comprehension appears to be a function of the experience of the interpreter whereas transmitting skills apparently are not related to experience (as "experience" has been defined herein). It would seem that CSUN interpreters develop adequate transmitting skills after training and within the first 300 hours of paid experience whereas reading comprehension becomes most efficient after training and at least 600 hours of paid experience. This being the case, a clear recommendation to those who are responsible for the basic training of new interpreters, and in-service training of experienced interpreters, is to emphasize reading and reversing skills over transmitting skills. This assumes that transmitting skills are developing along predictable lines and meet minimum proficiency levels.

Findings growing out of a comparison of data between the Jacobs study and the present study are of considerable interest.

To review:

1. Jacobs found significant differences in favor of a Hearing group receiving information through audition over a deaf group receiving information through an interpreter. The scores of deaf subjects averaged 16% below those obtained by hearing persons.

2. No significant differences were found on five of six measures between Minimum level interpreters in this study and deaf subjects in the Jacobs study.

3. Significant differences were found in favor of scores of Moderate and Maximum level interpreters in this study, over scores obtained by the deaf group in the Jacobs study.

4. No significant differences were found between Moderate and Maximum level interpreters in this study, and hearing subjects in the Jacobs study.

These data must be interpreted with care. The immediate temptation is to conclude that sign language is 16% less efficient than spoken language, that Minimum level interpreters "read" about as well as deaf subjects, and Moderate and Maximum level interpreter "readers" are superior to deaf "readers" of sign language. But the finding of no significant differences between Moderate and Maximum level interpreters, and Jacobs' hearing subjects suggests a different explanation and this chain of thought:

If Moderate and Maximum level interpreters acquire as much information through sign language as hearing counterparts do through normal auditory channels, then it must be concluded that sign language apparently equals spoken language as an efficient channel for the communication of information.

If sign language is the equal of spoken language, then the 16% gap in scores between deaf and hearing subjects, as found by Jacobs, is not attributable to deficiencies in sign language itself.

If the 16% gap in scores between deaf and hearing subjects cannot be attributable to deficiencies in sign language, then the gap must be explained by other factors, most likely, the basic language and educational deficit of deaf persons.

If deaf persons score lower because of linguistic and educational deficits, then Minimum level interpreters may obtain equal "reading" scores, not necessarily because they read as well, but because they have superior language skills. Further support for this possibility comes from the fact that Minimum level interpreters have had only about three years experience with sign language whereas the deaf subjects have had considerably more years of experience, some from birth. If reading comprehension is a function of experience, as this study concludes, then we would expect the most experienced group of readers, i.e., deaf persons, to score highest. They do not. This is probably so, not necessarily because they are poor at reading sign language, but because a basic language and educational deficit penalizes them as they process information through to the final measure of a formal paper and pencil test.

Therefore, it appears that the problem is neither with the ability of sign language to transmit information accurately, nor with the "reading" ability of the deaf person, but with unfamiliar words, or the multiple meaning of words, or other factors inherent in the basic problems associated with deafness.

Some previous doubts about the efficiency of sign language in our field come from observations of deaf subjects. Research using hearing subjects with normal language skills and a knowledge of sign language is recommended in future studies of the efficiency of sign language, particularly in that it frees the researchers from the confounding variable of the language limitation of deaf subjects.

Figure 1. Processing Model A

Transmitting Behavior

Figure 2. Processing Model B_1

Receiving Behavior

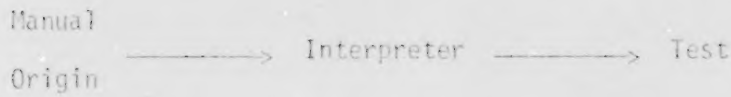

Figure 3. Processing Model B_2

Reversing Behavior

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